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Correlates of African American female adolescent offenders 3, 4-Methylenedioxymethamphetamine (MDMA or “Ecstasy”) use and sexually transmitted infection morbidity

Torrance Stephens^a, Rhonda Conerly Holliday^b, Shakita Hopkins^c, Shanhol Rose^d, Ronald Braithwaite^b, and Selina Smith^e

^aDepartment of Psychology; and Department of Political Science, Clark Atlanta University, Atlanta, Georgia, USA

^bDepartment of Preventive Medicine, Morehouse School of Medicine, Atlanta, Georgia, USA

^cDepartment of Biology, Clark Atlanta University, Atlanta, Georgia, USA

^dDepartment of Biology, University of West Georgia, Carrollton, Georgia, USA

^eInstitute of Public and Preventive Health, Georgia Regents University, Augusta, Georgia, USA

Abstract

The current study was designed to determine the extent to which self-reported ecstasy use in a population of juvenile adolescent detainees in a southern state is associated with high-risk health behaviors pertaining to sexually transmitted infection (STI) symptomology and past history of STI occurrence. Participants were 764 African American females extracted from an overall sample of 2,260 juvenile offenders housed at selected Youth Development Campuses in the state of Georgia. Significance tests were conducted using univariate logistic regressions to examine the independent associations of participant's self-reported ecstasy use and dichotomized HIV risk behavior correlates and history of having a prior STI before the most recent incarceration. Participants who reported ecstasy use prior to incarceration were 1.7 ($OR = 1.68$, 95% $CI = 0.78–3.64$) and 1.8 times ($OR = 1.87$, 95% $CI = 1.24–2.81$) more likely respectively to indicate having had genital warts or chlamydia, and were more than 1.5 times ($OR = 2.21$, 95% $CI = 0.83–5.44$) and two times more likely to report having had gonorrhea or herpes, accordingly. Prevention programs for adolescent offender populations should develop interventions that target adolescents' substance use behavior as a function of STI risk taking as well as being culturally competent to deal specifically with these problem behaviors.

Keywords

African American; ecstasy; female offenders; sexually transmitted infections (STIs)

Introduction

Epidemiological investigations among adolescent populations in the United States have frequently noted that those who engage in delinquent activities are especially vulnerable to the contraction of sexually transmitted infections (STIs) (Aalsma, Tong, Wiehe, & Tu, 2010; Braithwaite, Robillard, Woodring, Stephens, & Arriola, 2001; Stephens & Holliday, 2014; Wickrama, Merten, & Wickrama, 2012). This is of particular significance given reports documenting that in the United States nearly 20 million new cases of STIs occur annually, of which a significant proportion (48%) are adolescents between the ages of 15 and 24 years (Weinstock, Berman & Cates, 2004). Moreover, studies suggest that adolescents, including juvenile offenders and detainees, are at high risk for acquiring and transmitting STIs because of their high rates of substance use and substance-related risky sexual behaviors (Donaldson, Burns, Bradshaw, Ellen & Maehr, 2013; Elkington, Bauermeister, & Zimmerman, 2010; Ethier & St Lawrence, 2002; Romero et al., 2007). One drug of particular interest is ecstasy (methylenedioxymethamphetamine or MDMA).

As a drug of increased popularity among adolescents, ecstasy use has increased among this population (Abuse, 2007; Boyd, McCabe, & d'Arcy, 2003; Johnston, O'Malley, Bachman, & Schulenberg, 2007; Stephens, Holliday & Jarboe, 2015; Strote, Lee, & Wechsler, 2002); however, little is known as it pertains to STI morbidity risk associated with its use specifically among specific parameters of adolescent offenders, as a function of gender and ethnicity.

What is known in general has been conducted with other adolescent populations. Research documents a generally high prevalence of past-year ecstasy use among nonstudents and young adults between the ages 18 and 21 years (Wu, Schlenger, & Galvin, 2006) and that its use is considered the second most commonly used illicit drug among college students (Boyd et al., 2003; Pope, Ionescu-Pioggia, & Pope, 2001). Ecstasy use has also been demonstrated to be associated with having multiple sexual partners and use of alcohol and other drugs (Boyd et al., 2003; Strote et al., 2002). Wu and colleagues reported that in a sample of 20,858 adolescents ages 18–22, 2.3% reported a past-year STD and 3.9% reported a lifetime STD, with nonstudents being more likely than college students to report a lifetime STD (Wu, Ringwalt, Patkara, & Hubbard, 2009). Some have suggested that among urban populations history of ecstasy use plays a major role in individual perceived risk associated with sexual events (Singer & Schensul, 2011). Findings of a recent national community survey reported that in 2007 more than 12 million people in the United States had used ecstasy at least once (SAMHSA, 2008). Moreover, recent increases had been observed in rates of ecstasy use, and initiation of use, among adolescents (Abuse, 2009; SAMHSA, 2006).

Prior investigations have looked at the use of ecstasy with individual level, family level, and other sociodemographic variables including age, income, and race (Martins & Alexandre, 2009; Martins, Ghandour, & Chilcoat, 2007; Martins, Mazzotti, & Chilcoat, 2006; Martins, Storr, Alexandre, & Chilcoat, 2008; Puente, González Gutiérrez, Abellán, & Lopez, 2008). Also, there are reports that ecstasy use can be neurotoxic, resulting in deficits in memory and verbal ability (Cowan, Joers, & Dietrich, 2009; Montgomery & Fisk, 2008; NIDA,

2004)—all factors that may enhance sexual risk taking by adolescents. Additional problems associated with the use of ecstasy include but are not limited to lowered immune function and sleeping disorders (Connor, 2004; Schierenbeck, Riemann, Berger, & Hornyak, 2008). Adolescent users of ecstasy under 18 years of age are considered to be more vulnerable to its potential neurotoxic effects (Buchert et al., 2001), which makes it an important item of investigation in terms of problem behaviors that may occur due to its use, in particular behaviors that manifest in the form of sexual risk taking and outcomes associated with STI morbidity.

Little, however, is known about whether MDMA use increases the likelihood of STI occurrence among female African American adolescent offenders. Although researchers have examined STI risk behaviors among adolescent detainees (Cowan et al., 2009; Martins et al., 2008; Montgomery & Fisk, 2008; NIDA, 2004) limited information has been added to the literature specifically examining ecstasy use-based STI risk practices or outcomes in the form of history of past STIs. Within this context, the current study was designed to determine the extent to which self-reported ecstasy use in a population of juvenile adolescent detainees in a southern state is associated with high-risk health behaviors pertaining to STI symptomology and past history of STI occurrence. Thus the aim of this study is to examine distinctions, if any, between using ecstasy and STI outcomes among this population.

Methods

Participants were 764 African American females extracted from an overall sample of 2,260 juvenile offenders housed at selected Youth Development Campuses (YDCs) in the state of Georgia. Health educators approached prospective participants within the first 3 days of being admitted into the facilities, presented them with an overview of the study, and asked them to participate. Adolescents who agreed to take part in the study signed an assent form that gave members of the research team permission to contact their parents and/or legal guardian for their approval for participation. Prior to study implementation, approval was obtained from the university and the Department of Juvenile Justice Institutional Review Boards.

Measures

Demographics

Participants reported their age, race, and years of formal education, years incarcerated, and prior arrest.

Ecstasy use

This was measured using a single item from the drug use measures included in the survey instrument measured on scale ranging from 0 (0) to 5 (20 to 31 days). These response categories were recoded to compute a dichotomous variable of 1 = never and 2 = prior uses. Specifically, items asked during the last month before entering a detention center or YDC, how often have you used any of the following on your own that is, without a doctor telling you to take them. Participants with missing data were not included in the analysis.

STI symptomology

Participants responded to eight dichotomous items covering selected symptomology of possible STI infection. All items were prefaced with “In the last year, have you ever had any of the following happen to you.” Sample items from the instrument were “sore bumps or blisters near your sex organs or mouth,” for males, “a drip or drainage from the penis,” and for females, “burning or itching around the vagina.”

STI history

This variable was assessed with seven items specific to having been informed prior to their current detention if they had ever been informed that they had a STI by a doctor or a nurse. Dichotomous response options (yes or no) were collected and recorded for the following STIs: genital warts, chlamydia, syphilis, gonorrhea, herpes, trichomoniasis or “trich,” and public lice or “crabs.”

Statistical analysis

Data were examined with the use of SPSS software version 16.0. Descriptive statistics were employed to present a profile of the participant’s demographic characteristics. Significance tests were conducted using univariate logistic regressions to examine the independent associations of participant’s self-reported ecstasy use and dichotomized HIV risk behavior correlates and history of having a prior STI before the most recent incarceration. Adjusted odds ratios (*OR*) with 95% confidence intervals (*CI*) are presented. Univariate regression analysis was selected because the least squares regression curve minimizes the sum of squared differences between the estimated and the actual *y* values for given *x* values as well as because of the given assumption of normality. This means that the sum of squares and partial derivatives of each parameter estimated in each equation are defined and equated to zero.

To conform to the assumptions regarding that continuous variables in our study had multivariate normal distributions, non-normality was assessed in this study using Mardia’s test for multivariate normality (Mardia, 1970, 1974). The resulting multivariate index was not significant, providing statistical evidence for a normal distribution.

Results

The mean age of study participants was 14.8 years (*SD* = 1.23) who had reported spending an average of 23.4 days incarcerated prior to survey administration (*SD* = 28.44). Approximately 48.6% (*n* = 371) reported being locked up prior to the current incarceration, and the average education in terms of grade completion was the 8th grade (*SD* = 1.3). The mean age for participants’ age of first using alcohol was 13.29 (*SD* = 1.34) and 12.8 (*SD* = 2.25) years accordingly. Overall, participants reported having 2.29 (*SD* = 2.68) tattoos and that they first willingly had vaginal sex at age 13.5 (*SD* = 1.34) years of age. One item, prefaced with “in the 3 months before entering a detention center, how many times have you exchanged sex for drugs,” with responses ranging from 0 to more than seven times, was used to assess if study participants had ever exchanged sex for drugs used in general other than ecstasy. Findings did not observe any statistically significant association for drugs in

general. In addition, respondents with a history of ecstasy use were nearly two times more likely to have been incarcerated prior to their present incarceration ($OR = 1.71$, 95% $CI = 1.21$ – 2.40). Additional demographic details are presented in Table 1.

Ecstasy use

Bivariate associations between the assessed ecstasy use correlates and self-reported STI symptomology and occurrence (e.g., yes versus never) as well as corresponding prevalence ratios and their 95% confidence intervals are presented in Table 2. Table 2 also serves a descriptive purpose by showing the proportions of those who reported having ever used ecstasy previously and those that did not with respect to their agreement or disagreement with selected correlates.

Juveniles who reported having used ecstasy previously were more likely to report that they had sore bumps or blisters near their sex organs before ($OR = 1.42$, 95% $CI = 0.68$ – 2.93) and 1.5 times more likely to report having experienced burning or pain when urinating ($OR = 1.50$, 95% $CI = 0.91$ – 2.46). In addition, African American female offenders who reported prior ecstasy use were nearly two times more likely than no ecstasy users to have experienced the need to urinate frequently ($OR = 1.78$, 95% $CI = 1.25$ – 2.55) but just 1.3 times likely to have reported ever to have experienced discharge or odor from the vagina ($OR = 1.38$, 95% $CI = 0.93$ – 2.04).

Study participants were almost 2.5 times more likely to report having had pain in the lower pelvis or deep in the vagina during sex prior to this current incarceration compared to nonusers ($OR = 2.43$, 95% $CI = 1.50$ – 3.54) and more likely to having indicating having bleeding from their vagina at times other than their menstrual cycle ($OR = 2.14$, 95% $CI = 1.28$ – 3.59).

In terms of actual STI morbidity, study participants who reported ecstasy use prior to incarceration were 1.7 ($OR = 1.68$, 95% $CI = 0.78$ – 3.64) and 1.8 times ($OR = 1.87$, 95% $CI = 1.24$ – 2.81), respectively, to indicate having had genital warts and chlamydia. No major rates of occurrence distinctions were observed for African American female juvenile detainees with respect to syphilis ($OR = 1.19$, 95% $CI = 1.15$ – 1.22) as a function of past use or nonuse. However, study participants with a self-reported history of past ecstasy use were more than 1.5 times ($OR = 2.21$, 95% $CI = 0.83$ – 5.44) and two times more likely to report having had gonorrhea or herpes, accordingly.

Discussion

The primary objective of this investigation was to determine the prevalence of ecstasy use in a sample of African American female adolescent detainees and the extent to which ecstasy use is associated with high-risk health behaviors pertaining to STI symptomology and occurrence. Findings demonstrate that the use of this drug occurred among approximately 16% of the study sample, a rate higher than the level of use observed by von Sydow and colleagues in their study, albeit their measure was ecstasy/stimulant/hallucinogen use in a sample of adolescents and young adults (von Sydow, Lieb, Pfister, Höfler, & Wittchen, 2002). Our findings of participants' reported history of ecstasy use prior to this incarceration

period was nearly half that of the 30% reported by Cottler and associates in their investigation of ecstasy abuse and dependence among adolescents and young adults, a sample that was 52% were female and 23% nonwhite (Cottler, Womack, Compton, & Ben-Abdallah, 2001). We also observed significant higher rates of STI symptomology in the form of feeling that they needed to urinate frequently, pain in the lower pelvis or deep in the vagina during sex, and bleeding from the vagina at times other than participant's regular menstrual cycle. African American female detainees in our sample who reported using the drug were significantly more like to report having had chlamydia, with the likelihood of having had gonorrhea previously approaching significance.

This investigation is important for several reasons. First, use of ecstasy can have a neurotoxic impact on users leading to deficits in memory and verbal ability (Cowan et al., 2009; Montgomery & Fisk, 2008; NIDA, 2004), and other problems associated with ecstasy use include but are not limited to lowered immune function and sleeping disorders (Connor, 2004; Schierenbeck et al., 2008). Last, adolescent users of ecstasy under 18 years of age are considered to be more vulnerable to its potential neurotoxic effects (Buchert et al., 2001), which makes it an important item of investigation in terms of problem behaviors that may occur due to its use, in particular behaviors that manifest in the form of sexual risk taking and outcomes associated with STI morbidity.

Although studies have been conducted on ecstasy use with adolescent offenders and STI risk and outcomes before (Stephens, Holliday, & Jarboe, 2015), this is the first to our knowledge that looked specifically at African American female offenders. This suggests that results should be interpreted with some limitations in mind. The first pertains to the use of measures that rely on self-reporting of what some may consider personal, private, and sensitive information. Researchers have noted the possibility of potential bias from confounders from use of survey instruments with adolescent offender populations that may affect how respondents report the occurrence of such behaviors (Stephens, Braithwaite, & Turner, 2011). There is also the possibility that the small number of ecstasy users in our sample may impact and limit our ability to generalize our findings to other offender populations based on age, region, and even socioeconomic factors. However, the main concern remains that our subjects might be underreporting their drug use (Morral, McCaffrey, & Chien, 2003) and/or users in our investigation might refer to ecstasy as tablets/capsules that do not contain pure MDMA but might contain other substances (Baggott, 2002).

Notwithstanding these limitations, we believe that our study contributes to the literature of the associations of illicit drug use and STI morbidity and risk among African American adolescent offenders. Thus, prevention programs for adolescent offender populations should develop interventions that target adolescents' substance use behavior as a function of STI risk taking, as well as be culturally competent to deal specifically with these problem behaviors. Furthermore, prevention programs should inform adolescents that ecstasy use might impair their decision-making skills, consequently making the more susceptible to contracting STIs.

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Table 1

Demographic profile of study participants based on self-reported ecstasy use (missing values not included).

Variable	Ecstasy use		<i>p</i>
	Use (<i>n</i> = 636)	No Use (<i>n</i> = 119)	
	<i>n</i> (%)	(<i>n</i> /%)	
Prior incarceration			
Yes	74 (61.7)	293 (46.0)	
No	46 (38.3)	344 (54.0)	
Highest grade completed			.03
4th	0 (0.0)	2 (0.3)	
5th	1 (0.8)	12 (1.9)	
6th	5 (4.2)	52 (8.2)	
7th	17 (14.3)	118 (18.6)	
8th	28 (23.5)	197 (31.0)	
9th	40 (33.6)	156 (24.5)	
10th	20 (18.5)	88 (13.8)	
11th	6 (5.0)	10 (1.6)	
12th	0 (0.0)	1 (0.2)	
Do you have a tattoo?			.07
Yes	33 (27.7)	130 (20.4)	
No	86 (72.3)	506 (79.6)	
Do you have any body piercings?			.45
Yes	103 (87.3)	540 (84.9)	
No	15 (12.7)	96 (15.1)	

Bivariate logistic regression of African American female adolescent offenders ecstasy (MDMA) use and sexually transmitted infection (STD) morbidity and symptomatology.

Table 2

<u>Ever used ecstasy?</u>					
Factors	Yes (%)	No (%)	OR	95% CI	p value
Bumps or blisters near your sex organ	5.0%	3.3%	1.42	0.68–2.93	.35
Burning or pain when you urinate	11.4	7.5	1.50	0.91–2.46	.15
Feeling that you need to urinate frequently	26.9	15.2	1.78	1.25–2.55	.02
Vaginal discharge/odor	21.8	15.8	1.38	0.93–2.04	.02
Pain in lower pelvic region	10.1	3.3	2.44	1.50–3.95	.001
Bleeding from the vagina when not on period	9.2	3.6	2.14	1.28–3.59	.007
Genital warts	4.2	2.2	1.68	0.78–3.64	.21
Chlamydia	17.8	8.9	1.87	1.24–2.82	.004
Gonorrhea	11.8	7.1	1.55	0.95–2.54	.08
Trichomoniasis	10.9	6.5	1.58	0.95–2.61	.08
Herpes	2.5	1.0	2.12	0.83–5.44	.14